CLAIMS

1. A non-human transgenic animal having a transgene comprising a polynucleotide sequence encoding a tetracycline-controllable transactivator (tTA), the tTA comprising a Tet repressor operably linked to a polypeptide which directly or indirectly activates transcription in eucaryotic cells.

2. The animal of claim 1, wherein the Tet repressor of the tTA is a Tn10-derived Tet repressor.

3. The animal of claim 1, wherein the polypeptide of the tTA which directly or indirectly activates transcription in eucaryotic cells is from herpes simplex virus virion protein 16.

4. The animal of claim 1, further having a second transgene comprising a gene of interest operably linked to at least one *tet* operator sequence.

5. The animal of claim 1, which is a mouse.

6. The animal of claim 1, which is selected from a group consisting of a cow, a goat, a sheep and a pig.

7. The animal of claim 4, wherein a disease condition can be induced or inhibited in the animal by administering tetracycline or a tetracycline analogue to the animal.

8. A method for inhibiting transcription of the second transgene in the transgenic animal of claim 4, comprising administering tetracycline or a tetracycline analogue to the animal.

9. A non-human transgenic animal having a transgene comprising a polynucleotide sequence encoding a tetracycline-controllable transactivator (tTA), the tTA comprising a Tet repressor operably linked to a polypeptide which directly or indirectly activates transcription in eucaryotic cells, wherein the transgene is integrated by homologous recombination at a predetermined location within a chromosome within cells of the animal.

10. The animal of claim 9, wherein the Tet repressor of the tTA is a Tn10-derived Tet repressor.

11. The animal of claim 9, wherein the polypeptide of the tTA which directly or indirectly activates transcription in eucaryotic cells is from herpes simplex virus virion protein 16.

12. The animal of claim 9, further having a second transgene comprising a gene of interest operably linked to at least one *tet* operator sequence.

13. The animal of claim 9, which is a mouse.

14. The animal of claim 12, wherein a disease condition can be induced or inhibited in the animal by administering tetracycline or a tetracycline analogue to the animal.

15. A method for inhibiting transcription of the second transgene in the transgenic animal of claim 12, comprising administering tetracycline or a tetracycline analogue to the animal.

16. A transgenic animal having a transgene comprising a polynucleotide sequence encoding a tetracycline-controllable transactivator (tTA) and a tTA-responsive promoter, wherein the transgene is integrated by homologous recombination at a predetermined location within a gene of interest within cells of the animal such that expression of the tTA is controlled by 5' regulatory elements of the gene of interest and expression of the gene of interest is controlled by the tTA-responsive promoter.

17. The animal of claim 16, wherein the Tet repressor of the tTA is a Tn10-derived Tet repressor.

18. The animal of claim 16, wherein the polypeptide of the tTA which directly or indirectly activates transcription in eucaryotic cells is from herpes simplex virus virion protein 16.

19. The animal of claim 16, further having a second transgene comprising a gene of interest operably linked to at least one *tet* operator sequence.

20. The animal of claim 16, which is a mouse.

21. The animal of claim 19, wherein a disease condition can be induced or inhibited in the animal by administering tetracycline or a tetracycline analogue to the animal.

22 A method for inhibiting transcription of the second transgene in the transgenic animal of claim 19, comprising administering tetracycline or a tetracycline analogue to the animal.